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INITIAL RELEASES OF *CHRYSOCHARIS LARICINELLAE* AND *DICLADOCERUS WESTWOODII*[1/] FOR BIOLOGICAL CONTROL OF THE LARCH CASEBEARER IN THE WESTERN UNITED STATES

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ABSTRACT

A total of 240 Chrysocharis laricinellae *and 513* Dicladocerus westwoodii *(Hymenoptera: Eulophidae) from Austria and England were released in Washington and Idaho in 1972. This is the first attempted establishment of these parasites in western North America for biological control of the larch casebearer.*

Keywords: *Biological control (pests), larch casebearer,* Coleophora laricella.

[1/] Hymenoptera: Eulophidae.

The larch casebearer, *Coleophora laricella* (Hbn.) (Lepidoptera: Coleophoridae), discovered in western North America in 1957 near St. Maries, Idaho (Denton 1958), has spread over much of the range of western larch, *Larix occidentalis* Nutt., in Idaho, Montana, Washington, Oregon, and British Columbia. Larch stands on the eastern slopes of the Cascade Range in Oregon and Washington are apparently still uninfested.

Population levels are commonly high in infested stands, with counts of overwintering casebearers reaching 200 or more per 100 buds in the older areas of infestation. Repeated moderate to severe defoliation has resulted in severely reduced radial increment, branch mortality, and some tree mortality (Tunnock et al. 1969).

A biological control program was initiated in 1960 with the introduction of *Agathis pumila* (Ratz.) (Hymenoptera: Braconidae) (Denton 1972) from colonies previously established in the northeastern United States (Dowden 1962). In 1972 two other parasitoids were introduced, *Chrysocharis laricinellae* (Ratz.) and *Dicladocerus westwoodii* Westw. (Hymenoptera: Eulophidae).[2/] [3/] The objective of this report is to document those liberations.

Collections of parasitized larch casebearer larvae and pupae were made at several locations in Austria and near Cinderford, Gloucestershire, England, through arrangements with H. Pschorn-Walcher of the European Station, Commonwealth Institute of Biological Control, Delemont, Switzerland. Material was shipped to the Research Institute, Canadian Department of Agriculture, Belleville, Ontario, where adult parasites emerged and were forwarded to Corvallis, Oregon, by J. S. Kelleher and G. D. Williamson.

A total of 513 *D. westwoodii* and 240 *C. laricinellae* was released in Washington and Idaho (table 1). Parasite releases were made on predesignated study plots to facilitate subsequent evaluation of parasite effectiveness. Unfortunately, by June 7, when the first shipment of *D. westwoodii* arrived, the bulk of the casebearer population on most plots had pupated and passed the stage where they were susceptible to parasitism. However, larvae were still present in the Charley Creek plot, and *D. westwoodii* was released. *C. laricinellae* was first available for release on June 17. Because

[2/] Identification of European parasites made by Dr. C. Yoshimoto, Canadian Forestry Service, Department of the Environment, Ottawa. Voucher specimens have been deposited at the U.S. National Museum, Washington, D.C.

[3/] The *Dicladocerus westwoodii* released is believed to be distinct from the *Dicladocerus* sp. which is already present. According to Dr. B. D. Burks, U.S. National Museum, Washington, D.C., specific distinction can be found in the longer branches on the male antennae in *D. westwoodii* than in *Dicladocerus* sp. No distinctive characters have been found to separate the females.

synchronization with the susceptible casebearing larvae was poor, adults were held in the laboratory until this stage was again available in September. Meanwhile, separate colonies of *C. laricinellae* from Austria and England were established on the larch casebearer in the laboratory. The Austrian colony furnished the individuals for the September 26 release. A third colony of *C. laricinellae* was started from individuals collected from the casebearer in Wisconsin by H. C. Coppel and J. W. Mertins. The numbers of parasites in the English and Wisconsin colonies were too low for release in 1972 and are being maintained for subsequent release. Collection and rearing efforts will continue to provide additional individuals and other parasite species for release in these and other areas in Washington and Montana.

Table 1.--Releases of *Dicladocerus westwoodii* and *Chrysocharis laricinellae* against larch casebearer in Washington and Idaho, 1972

Liberation site	Source	Date of release	Number released		
			Male	Female	Total
D. westwoodii:					
Charley Creek, 15 miles S. Pomeroy, Washington 46°15'N, 117°30'W	Austria	June 7	116	57	173
	England	June 7	44	26	70
U.S. Hwy. 95, 25 miles N. Moscow, Idaho 47°02'N, 116°52'W	Austria	June 27	132	79	211
		July 6	31	28	59
C. laricinellae:					
U.S. Hwy. 95, 25 miles N. Moscow, Idaho 47°02'N, 116°52'W	Austria	September 13	10	90	100
	lab reared (Austrian stock)	September 26	53	87	140

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